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Electrochemical aptasensor based on polycarboxylic macrocycle modified with neutral red for aflatoxin B1 detection

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Abstract

© 2014 Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim. Novel electrochemical aptasensors based on glassy carbon electrodes modified with electropolymerized Neutral red and polycarboxylated macrocyclic ligands onto which the DNA aptamers were covalently attached have been developed for detection of Aflatoxin B1 (AFB1). The interaction with an analyte resulted in the decrease of the cathodic peak current of the probe measured by CV and in the increase of the electron transfer resistance determined by EIS. The limit of detection was found to be 0.1 nM for CV and 0.05 nM for EIS methods, respectively. The aptasensor makes it possible to detect AFB1 in peanuts, cashew nuts, white wine and soy sauce with a recovery of 85-100%.

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Keywords

Aflatoxin B1, Aptasensor, DNA Aptamer, Electrochemical impedance spectroscopy, Thiacalix[4]arene, Voltammetry